

FOOD AND EXERCISE CALCULATOR

BACKGROUND OF THE INVENTION

[0001] Affecting nearly seventeen million Americans, type-2 diabetes is the most prevalent form of diabetes mellitus. There are many precipitating factors
5 involved in the cause of type-2 diabetes, but more often than not, overeating, inactivity, and consumption of unhealthy foods are the main causes of the disease. Since there is no present cure for diabetes, it becomes imperative that type-2 diabetics closely monitor their food intake, and balance this intake with exercise and physical activity in order to maintain glucose levels that are as close to normal as
10 possible. Planning a healthy, balanced diet and exercising regularly can significantly improve the life of a person dealing with type-2 diabetes. The present invention is designed to assist in this process.

BRIEF DESCRIPTION OF THE PRIOR ART

15 [0002] On a daily basis, type-2 diabetics are faced with monitoring their food intake in relation to exercise activity. Although there are current diet calculators available to display the nutritional makeup of different foods, none are able to relate this nutritional data to the amount of physical activity needed to compensate for them, and burn them off. Thus, while these prior calculators can illustrate the
20 nutritional value of certain food items, they cannot convert these values into terms that are meaningful to the user, i.e., the amount of time they will need to dedicate to exercising in order to “burn off” this food item if they are to eat it. The present

invention puts the nutritional information into more concrete terms for the user. Knowing that a slice of pizza will take 36 minutes of aerobic activity to burn off is much more valuable than simply knowing that it contains 190 calories. Having this information available before eating the pizza helps an individual to better understand the actual consequences of eating it. Type-2 diabetics need to be able to access this information easily and effortlessly, on a regular basis, so that they can see the consequences of consuming various types of foods in terms of the effects on their diet and weight. Of course, all individuals, whether diabetic or not, would benefit from knowing how much exercise would be required to compensate for the food they eat in order to maintain a healthy lifestyle, proper weight, and fitness level.

SUMMARY OF THE INVENTION

[0003] The food and exercise calculating aid according to the invention includes a memory for storing nutritional information for a variety of food items and metabolic equivalent information for a variety of exercises. A controller is connected with the memory to control the selection of information to be obtained from the memory. A calculator is connected with the memory in order to calculate an exercise duration time necessary to burn the calories of a selected food item while performing the selected exercise. A display is connected with the memory and with the calculator to display the selected nutritional and metabolic equivalent information and the calculated exercise duration time.

[0004] The memory preferably comprises three portions or three separate memories. The first memory stores the nutritional information. The second memory

stores the metabolic equivalent information. The third memory stores weight information which is also a factor used by the calculator for calculating the exercise duration time.

[0005] The invention also relates to an exercise calculation method for an individual. According to the method, a food item to be consumed is selected. Next, an exercise to be performed is selected. The weight of the individual is then selected following which the duration of the selected exercise is calculated for burning the calories of the selected food item for the individual. The calculation is according to the formula

$$T = \text{kcal} / \text{MET} \times 3.5 \times W / 200$$

where T is the exercise time, in minutes; kcal is the number of kilocalories for the selected food item; MET is the metabolic equivalent for the selected exercise; and W is the selected weight of the individual, in kilograms.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] Other objects and advantages of the invention will become apparent from a study of the following specification when viewed in the light of the accompanying drawing, in which:

[0007] Figs. 1-7 are plan views, respectively, of the food and exercise calculating aid according to the invention showing the information displayed to an individual during the calculation process shown in Fig. 1;

[0008] Fig. 8 is a block diagram of the sequence of steps for calculating an exercise duration according to the invention; and

[0009] Fig. 9 is a block diagram of the food and exercise calculating aid according to the invention.

DETAILED DESCRIPTION

[0010] Figs. 1-7 show the food and exercise calculating aid 2 according to the invention. Referring to Fig. 1, the calculating aid includes a housing 4 including a hinged cover 6 within which instructions 8 for operating the calculating aid are provided. On the face of the housing is a display 10, an on-off switch 12, scrolling buttons 14, a selector switch 16, and a switch 18 for going back to a previous menu. As will be developed below, Figs. 2-8 illustrate the different information displayed on the display 10 during the operation of the calculating aid.

[0011] In Fig. 8 is shown the method steps for operating the calculating aid and Fig. 9 is a block diagram showing the components of the calculating aid. The input selector 20 includes the scroll, selector and back buttons shown in Fig. 1. It is used to select from the choices shown on the display 10 for various food items, exercises, and weights. A controller 22 controls which of the memories 24, 26, 28 is activated. The first memory 24 contains nutritional information for various foods. The foods are arranged by food groups within the memory 24. The second memory 26 has stored therein various exercises and the metabolic equivalents for each. The metabolic equivalent is a function of the exertion required by a particular exercise. An explanation thereof and sample metabolic equivalents for various exercises are available from the American College of Sports Medicine Guidelines for Exercise

Testing and Prescriptions (Sixth Edition, 2000). The third memory 28 contains a plurality of weight ranges.

[0012] A suitable controller is the SPL 130A 128K-byte LCD controller and a suitable display is the ST 2101C dot matrix LCD driver.

5 **[0013]** The memories are connected with the display 10 to display information for a selected food, exercise and weight. A calculator 30 is connected between the memories and the display and calculates the duration of exercise time required to burn off the calories of a selected food using a selected exercise for a person of the selected weight.

10 **[0014]** Once the aid is activated, the display prompts the selection of a food group as shown in Fig. 2. By operating the scroll buttons 14, numerous food groups are displayed. Sample food groups are displayed in Table I.

Table I - Food Groups

	Baked Products
15	Beverages
	Cereals
	Dairy
	Desserts
	Restaurants
20	Fruits
	Meals (prepared)
	Meats
	Seafood
	Snacks
25	Vegetables

[0015] When the desired food group is displayed and highlighted, the select button is operated and the next menu is displayed. The menu contains a list of food items for a selected group. Thus, if “Baked Products” was selected from the listed groups of Fig. 2, a list of food items from the memory 24 is displayed as shown in Fig. 3.

[0016] Tables II - VIII contain sample food items for various food groups.

Table II - Baked Products

	Bagels
10	Biscuits
	Bread
	Bread stuffing
	Cake
	Cookies
15	Crackers
	Croissants
	Danish pastry
	Doughnuts
	English Muffins
20	Muffins
	Pancakes
	Pie (and pie crust)
	Sweet rolls
	Toaster pastries
25	Tortillas

Table III - Cereals

	Kelloggs
	Quaker
5	General Mills
	Malt-O-Meal
	Cream of Wheat (also Cream of Rice)
	Post (Kraft)
10	Other (Heartland Natural Cereal, Maypo, Ralson, Wheatena, Maltex, Roman Meal, etc.)

Table IV - Restaurants

	Arby's
	Boston Market
	Bruegger's Bagels
15	Burger King
	Dairy Queen
	Denny's
	KFC
	Krispy Kreme
20	Leeann Chinn
	McDonalds
	Olive Garden
	Pizza Hut
	Red Lobster
25	Subway
	Taco Bell

Table V - Fruits and Fruit Juices

	Avocados
	Apples and apple products (apple juice, applesauce)
	Apricots
5	Bananas
	Berries (blackberries, blueberries, boysenberries, strawberries, raspberries)
	Cherries
	Fruit salad and fruit cocktails
10	Grapefruit and grapefruit juice
	Grapes and grape juice
	Melons
	Oranges and tangerines, fruits and juices
	Peaches
15	Pears
	Pineapple
	Prunes and prune juice
	Other (kiwi fruit, currants, rhubarb)

Table VI - Meals (prepared)

20	Banquet
	Budget Gourmet
	Chef Boyardee
	Hormel
	Hot Pockets
25	Kraft
	Marie Callender's

	Nestle, Chef-Mate
	Stouffers
	Sunny Fresh
	Weight Watchers
5	Worthington Foods/Morningstar Farms
	Other (Jimmy Dean, Nalley, Red Baron, Tyson, Stagg, etc.)

Table VII - Desserts

	Candies, Hershey
10	Candies, M&M Mars
	Candies, Nestle
	Candies, other
	Frostings
	Frozen desserts
15	Gelatins
	Gum
	Honey and molasses
	Jams and jellies (including marmalade and fruit butters)
	Puddings, custards and flan
20	Syrups
	Toppings
	Other (sugar, sweeteners, pie filling, fruit leather, etc.)

Table VIII - Snacks

	Fruit snacks and Fruit Roll-Ups
25	Granola bars (including Kudos)
	Popcorn

- Potato chips
- Pretzels (including Combos)
- Rice cakes
- Tortilla chips
- 5 Trail mix
- Other (beef jerky, corn-based items, Corn Nuts, Chex Mix, Sesame Sticks, Nutri-Grain bars, Rice Krispie Treats, etc.)

[0017] The above tables contain only representative samples of food groups
 10 and items. Any number of additional items may be included and the grouping of items can be altered as desired.

[0018] When the desired food item is displayed (Fig. 3), the select button is activated to obtain from the food memory 24 the nutritional information for the item. The nutritional information is automatically displayed on the display 10 as shown in
 15 Fig. 4 and sent to the calculator 30. The nutritional information includes calories per serving, carbohydrates (in grams), carbohydrate choices, fats (in grams), and proteins (in grams). The typical portion or serving size is also provided. The carbohydrate choices are automatically calculated by the calculator 30 based on the number of grams of carbohydrates in the food item using the following formula:

$$20 \quad \text{Carbohydrate Choices} = \text{Carbohydrates (grams)} \div 15$$

[0019] After the nutritional information has been displayed, the selector button is activated and the controller 22 accesses the second memory 26 to display various exercises as shown in Fig. 5. Examples of exercises are set forth in table IX.

Table IX - Exercises

5	Aerobics
	Basketball
	Bicycling (5.5 mph)
	Bicycling (13 mph)
	Bowling
10	Dancing
	Gardening
	Golfing
	Jogging (5.5 mph)
	Jogging (8 mph)
15	Martial/kickbox
	Mowing lawn
	Shoveling snow
	Tennis/handball
	Walking (2 mph)
20	Walking (4 mph)
	Weightlifting
	Yoga/stretching

[0020] The user scrolls through the exercise menu using the scroll buttons 14 until the desired exercise is highlighted. Activation of the select button 16 sends
 25 metabolic equivalent information for the selected exercise to the calculator 30.

[0021] Next, the weight range information from the third memory 28 is displayed on the display 10 as shown in Fig. 6. The weight ranges are scrolled by operation of scroll buttons 14 until the weight range for the user is displayed.

Operation of the select button sends the weight range information to the calculator
5 30.

[0022] The calculator 30 calculates an exercise duration time necessary for the individual to burn off the calories associated with the selected food item by performing the selected exercise using the formula

$$T = \text{kcal} / \text{MET} \times 3.5 \times W / 200$$

10 where T is the exercise time in minutes, kcal is the number of kilocalories for the selected food item, MET is the metabolic equivalent for the selected exercise and W is the selected weight, in kilograms, of the individual. The calculated duration time for the exercise is displayed on the display as shown in Fig. 7.

[0023] A less accurate, but still valuable, calculation of the exercise duration
15 time can be obtained by omitting the weight factor from the equation or by using a default value such as 150 pounds

[0024] The diet and exercise calculator according to the invention benefits many individuals involved in caring for those with type-2 diabetes as well as the patients themselves. Family members of diabetics, or those who are at risk of
20 developing type-2 diabetes would benefit from the calculator as well. Diabetic educators and physicians can use the product to help educate and inform those at risk to help them change their unhealthy habits before they actually develop the disease. The general public would also find the calculator to be useful in their attempts to

live a healthy lifestyle. The diet and exercise calculator allows people to view the consequences of eating certain FDA categorized foods prior to consumption, and relate this to a specific physical activity. The calculator displays the nutritional information and calculates the amount to time it will take, while performing a
5 selected activity, to burn off the fat and calories of a selected food item.

[0025] While the preferred forms and embodiments of the invention have been illustrated and described, it will be apparent to those of ordinary skill in the art that various changes and modification may be made without deviating from the inventive concepts set forth above.